REMARKS

This Amendment is filed in response to the Final Office Action dated November 13, 2002 and further in response to the Decision on Appeal dated January 19, 2006 from the Board of Patent Appeals and Interferences ("Board") regarding same. This Amendment is submitted concurrently with a Request for Continued Examination and the requisite fee associated with same. Accordingly, Applicants believe that the Amendment has been timely and properly filed, and thus respectfully request that the finality of the rejection be withdrawn and that the Amendment be entered for examination purposes as discussed in further detail below.

In the Final Office Action, claims 2-4, 6-9 and 12 were rejected under 35 U.S.C. §103 in view of EP072405 ("Akashi") and U.S. Patent No. 5,522,127 ("Ozaki"). The final rejection of claims 2-4, 6-9 and 12 was affirmed by the Board as detailed in the Decision on Appeal as discussed above. In response, claim 12 has been amended and claims 13 and 14 have been newly added as previously provided. Therefore, Applicants believe that the obviousness rejection has been overcome in view of the amendments and at least for the reasons as detailed below.

Of the pending claims, claim 12 is the sole independent claim. Claim 12 recites a gel electrolyte secondary cell including a positive electrode; a negative electrode; and a gel electrolyte. The negative electrode includes a current collector and a powder mixture including a graphitized carbonaceous material obtained from a plurality of meso-carbon micro-beads and a binder, wherein the powder mixture is coated on the current collector at a thickness ranging from 10 μm to 200 μm. The gel electrolyte includes an electrolyte salt, a non-aqueous solvent and a high-molecular weight material having a number average molecular weight ranging from 5000 to 500000 wherein the non-aqueous solvent at least includes propylene carbonate and ethylene carbonate. As amended, claim 12 further recites that the propylene carbonate ranges from 35 mol% to 75 mol%. Claims 13 and 14 have been newly added to further specify a specific surface area of the graphitized carbonaceous material.

The gel electrolyte secondary cell as claimed provides both a large discharge capacity and a high charging/discharging efficiency. See, Applicants' specification, page 7, lines 12-14. To achieve this, the claimed gel electrolyte secondary cell includes, in part, a specific-type of graphitized carbonaceous material (e.g., meso-carbon based) in addition to a specific-type of gel

electrolyte that includes propylene carbonate as a solvent in an amount ranging from 35 mol % to 75 mol%. Applicants have conducted experiments that demonstrate the enhanced discharge capacity and discharging/charging efficiency properties of the claimed gel electrolyte secondary cell as compared to gel electrolyte secondary cells made from a carbonaceous material (e.g., Comparative Examples 1 and 2) different from the claimed meso-carbon based material. See, Applicants' specification, pages 15-24.

Further, Applicants' experiments demonstrate that enhanced properties can be achieved with propylene carbonate as a solvent in the gel electrolyte, even with a negative electrode that includes a meso-carbon based material at a small particle size, such as 3.6 m^2/g (Example 1) and 1.2 m^2/g (Example 2). See, Applicants' specification, pages 15-18. This discovery was contrary to the general understanding in the art at that time.

For example, in the non-aqueous liquid electrolyte secondary cell, employing propylene carbonate as a main solvent and a graphite type carbonaceous material as a negative electrode material, propylene carbonate is decomposed on the negative electrode with gas evolution. The reason is that propylene carbonate is unstable against the graphite type carbonaceous material. If such decomposition occurs, the electrical power to be used for charging is wasted by this decomposition thereby producing discharge capacity loss and lowering the charging/discharging efficiency. Such discharge capacity loss due to decomposition of propylene carbonate, similarly occurs in a cell that employs a gel electrolyte. See, Applicants' specification, page 5, lines 5-14.

Further, it was generally understood in the art at such time that the degree of decomposition of propylene carbonate can differ with different physical properties associated with graphite type carbonaceous material. For example, larger particle-sized material (e.g., smaller surface contact area) was generally understood to be less susceptible to decomposition of propylene carbonate as compared with smaller particle-sized material (e.g., larger surface contact area). See, Applicants' specification, page 5, line 15 to page 6, line 5. However, larger particle-sized materials can negatively impact cell performance. See, Applicants' specification, page 6, line 6 to page 7, line 6. Again, Applicants have demonstrated that the claimed gel electrolyte secondary cell can provide enhanced performance with propylene carbonate as a gel electrolyte solvent, even in combination with a negative electrode that includes a meso-carbon

based material having a particle size as claimed and further defined in dependent claims 13 and 14.

Applicants believe that the claimed invention is distinguishable from the cited art even if properly combinable. At the outset, the primary Akashi reference fails to provide a negative electrode that includes a meso-carbon based material as claimed. Further, Akashi provides a list of suitable negative electrode materials that includes petroleum cokes. See, Akashi, page 4, lines 12-16. In contrast, Applicants have demonstrated that gel electrolyte secondary cells with a negative electrode made from a meso-carbon based material (Examples 1-4) outperforms gel electrolyte secondary cells made with a negative electrode that includes petroleum coke (e.g., Comparative Examples 1 and 2) as previously discussed. See, Applicants' specification, for example, page 20, lines 1-11 (Table 1) and pages 23-24 (Table 2). Therefore, Akashi's recognition of a petroleum coke-based negative electrode effectively teaches away from the meso-carbon based negative electrode as claimed.

Further, the Akashi reference fails to recognize a gel electrolyte secondary cell that includes a negative electrode made from a meso-carbon based material in addition to a gel electrolyte with propylene carbonate in combination with ethylene carbonate as a solvent. Again, Akashi provides a list of possible suitable negative electrode materials that includes carbonaceous materials (not including meso-carbon based) in addition to metallic lithium and lithium alloys. Of this possible list of materials, the examples in Akashi merely referred to metallic lithium (see, Akashi, page 9, lines 39-40), and thus, Akashi fails to demonstrate the gel electrolyte secondary cell as claimed, let alone with a meso-carbon based material having a specific surface area as further recited in claims 13-14. Therefore, Akashi on its own is clearly distinguishable from the claimed invention.

Applicants do not believe that the Ozaki reference can remedy the deficiencies of Akashi. Like Akashi, Ozaki fails to provide a gel electrolyte secondary cell that includes a negative electrode made from a meso-carbon based material in addition to a gel electrolyte with propylene carbonate, let alone propylene carbonate at 35 mol% to 75 mol% in combination with ethylene carbonate as claimed. Clearly, Ozaki disfavors the use of propylene carbonate, let alone the use of propylene carbonate in combination with another solvent, such as ethylene carbonate. See, Ozaki, col. 7, lines 5-16. At best, the combination of Ozaki and Akashi, even if proper, would

result in a gel electrolyte secondary cell that utilizes the negative electrode of Akashi without the use of propylene carbonate as a solvent. Again, the Akashi reference merely demonstrates a negative electrode that includes metallic lithium in combination with a gel solution including propylene carbonate as previously discussed. Moreover, Akashi employs 28 mol% propylene carbonate (See, Akashi, page 9, lines 45-52) in contrast to 35 mol% to 75 mol % of propylene carbonate as claimed.

Further, nowhere do Akashi and Ozaki, even if properly combinable, provide a gel electrolyte secondary cell that includes a negative electrode with a meso-carbon based material that has a specific surface area as further recited in claim 13 (e.g., 10 m^2/g or less) and claim 14 (e.g., 0.1 m^2/g to 5.0 m^2/g). Indeed, the Ozaki reference disfavors the use of propylene carbonate as a solvent in combination with a negative electrode material that has a specific surface area from 1.0 m^2/g to 8.0 m^2/g. Again, Applicants have demonstrated that the claimed gel electrolyte secondary cell can provide enhanced performance with propylene carbonate as a gel electrolyte solvent, even in combination with a negative electrode that includes a meso-carbon based material having a small particle size as claimed and as further defined in dependent claims 13 and 14. Moreover, Akashi merely demonstrates a negative electrode that includes metallic lithium in combination with a gel solution including propylene carbonate as previously discussed. Therefore, Applicants do not believe that Akashi and Ozake can be combined and/or modified to cover the claimed invention, and to do so would be an improper application of hindsight reconstruction.

Accordingly, Applicants respectfully request that the obviousness rejection in view of Akashi and Ozaki be withdrawn.

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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